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Mapping stakeholders associated with societal challenges: A Methodological Framework

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Abstract

This paper explores the concept of stakeholders at national level in the context of societal challenges associated with: Health, demographic change and wellbeing; Food security, sustainable agriculture, marine and maritime research & the bioeconomy; Secure, clean and efficient energy; Smart, green and integrated transport; Climate action, resource efficiency and raw materials; Europe in a changing world - inclusive, innovative and reflective societies; and Secure societies – protecting freedom and security of Europe and its citizens. It focuses on how to effectively identify and map those individuals, groups and organisations likely to be affected by, or likely to have an influence on societal challenges and thereby effectively helping to understand the importance of considering stakeholders when addressing societal challenges, identify stakeholders, and understand their relationship to each societal challenge, and map and prioritise stakeholders. Research presented in this paper was carried out as part of the CASCADE project (Collaborative Action towards Societal Challenges through Awareness, Development, and Education) which aimed to provide the foundation for a future International Cooperation Network programme targeting South Asian Countries, which will promote bi-regional coordination of Science & Technology cooperation. The objectives of CASCADE included to map and develop an inventory of national and regional stakeholders related to global challenges amongst other objectives and targeted and had the participation of seven South Asian countries, namely, Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka.

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Keywords: societal challenges, stakeholders, stakeholder mapping

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1. Introduction

The European Union (EU), whilst representing only 7% of the world's population, is responsible for 24% of world expenditure on research, 32% of high impact publications and 32% of patent applications, making it a world leader in research and innovation [1]. However, over the past few decades, new key players have emerged within the international landscape shifting the previously dominant position held by the EU towards emerging economies. The EU recognise a need to strengthen internationalisation through strategic policy action. The need for linkages with Asian countries has been highlighted given the region's rapidly growing research and innovation capacities and the urgency to address global challenges. South Asia in particular is home to more than 40% of the world's absolute poor, but will contribute nearly 40% of the growth in the world's working-age population in the coming decades. CASCADE project (Collaborative Action towards Societal Challenges through Awareness, Development, and Education) aims to provide the foundation for a future International Cooperation Network programme targeting South Asian Countries, which will promote bi-regional coordination of Science & Technology cooperation between Europe and South Asia. The objectives of CASCADE included to map and develop an inventory of national and regional stakeholders related to global challenges amongst other objectives and targeted and had the participation of seven South Asian countries, namely, Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka. The key challenges faced by the targeted south Asian countries are wide and varied, and the current stakeholders and policy makers involved in addressing the key societal challenges associated with Horizon 2020 and their level of competences are, to a certain extent, culturally diverse and based on the particular context.

1.1. Horizon 2020 and its societal challenges

Horizon 2020 is the largest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market. It includes establishing links with the activities of the European Innovation Partnerships. H2020 addresses societal challenges such as climate change, the ageing population, energy security and others which have become major determinants for research promotion in recent years [2]. While some years ago most research programmes at European level as well as at national level were structured by research themes or disciplines, the trend is now to design research programmes in such a way as to contribute to meeting major societal challenges. Such programmes are usually interdisciplinary and often cover the entire innovation chain from fundamental research to demonstration (ERA, 2017). In this context, the societal challenges are priority challenges that the EU has identified where targeted investment in research and innovation can have a real impact benefitting the citizen. These societal challenges include [3]: Health, demographic change and wellbeing; Food security, sustainable agriculture, marine and maritime research & the bioeconomy; Secure, clean and efficient energy; Smart, green and integrated transport; Climate action, resource efficiency and raw materials; Europe in a changing world - inclusive, innovative and reflective societies; Secure societies – protecting freedom and security of Europe and its citizens

European Commission report on 'Enhancing and focusing EU international cooperation in research and innovation' [4] identifies that global challenges are important drivers for research and innovation. Thus, the EU needs to strengthen its dialogues with international partners to build critical mass for tackling these challenges. In this context, this paper aims at identifying and mapping of key national and regional stakeholders in South Asia that can influence and address the societal challenges addressed by the H2020. Even though the paper is based on the data that was collected in the identified target countries, the resulted framework can be applied and used in any other regions and countries. Accordingly, this paper discusses stakeholder identification and mapping in relation to societal challenges. Stakeholders are typically considered in respect of a specific context, such as an organisation, project or an issue. The basic principles of stakeholder identification and mapping remain consistent regardless of context.

2. Stakes and stakeholders

A stake is an interest of a share in an undertaking and a stakeholder is an individual with a stake [5]. Accordingly, a stakeholder in the context of societal challenges is anyone who has an influence on changing the status of a particular societal challenge in a country or anyone who can potentially be harmed or have their rights affected by

societal challenges. Fundamentally, stakeholders in this context are who affect or are affected by a societal challenge and/or its key areas. Stakeholders of a societal challenge in a country can be individuals, groups, organisations or sectors. Diverse sources may trigger stakes. Frequently, stakes can be influenced by economic, social, cultural, environmental or political considerations. Further, stakes may take different forms. A stake can be interest, authority, responsibility, rights, ownership, knowledge, capacity, impact/ influence or contribution [6, 7]. Stakeholders may have the power to be either a threat or a benefit. Stakeholders are beneficial when they help a country address a societal challenge, but can be antagonistic when they oppose the mission. They may exert their influence either deliberately or incidentally.

2.1 Why are stakeholders important?

Differing classifications of stakeholders have emerged due to many reasons. Mitchell et al. [6] highlighted that different classes of stakeholders can be identified by possession of attributes, such as: the stakeholder's power to influence the firm; the legitimacy of the stakeholder's relationship with the organisation; and, the urgency of the stakeholder's claim on the organisation. The word ‘stakeholder’ has assumed a prominent place in public and non-profit management theory and practice in the last 20 years, and especially in the last decade. Initially, most stakeholder literature concentrated on the dyadic relationships between individual stakeholders and a focal organisation [8], considering the organisational interactions with stakeholders as independent relationships. The term refers to persons, groups or organizations that must somehow be taken into account by leaders, managers and front-line staff [9]. R. Edward Freeman, in the now classic text Strategic Management: A Stakeholder Approach [8], defined a stakeholder as ‘any group or individual who can affect or is affected by the achievement of the organization’s objectives’. Stakeholders are conceptualised as having direct relationships with one another and relationships emerge depending on the context and necessity [10, 11].

Addressing a societal challenge may depend on stakeholders for resources, services, support, approval and information. The argument is that stakeholders have claims, rights and expectations, many of which ought to be honoured and not taken lightly. Consequently, it is vital that stakeholders are identified, their stakes and characteristics understood, and a clear plan prepared for how the any initiatives to address a societal challenge will engage with them.

2.2 Stakeholder identification and analysis

Bryson [9] focused specifically on how and why managers might go about using stakeholder identification and analysis techniques in order to help their organizations meet their mandates, fulfill their missions and create public value and a range of stakeholder identification and analysis techniques is reviewed. The techniques cover: organizing participation; creating ideas for strategic interventions, including problem formulation and solution search; building a winning coalition around proposal development, review and adoption; and implementing, monitoring and evaluating strategic interventions. He further argued that wise use of stakeholder analyses can help frame issues that are solvable in ways that are technically feasible and politically acceptable and that advance the common good. Missionier and Loufrani-Fedida [12] investigated the stakeholder analysis and engagement in the field of project management and state that a relevant approach informs the project managers about what to observe in stakeholder project networks, as well as how and when to observe them.

As already identified above, supporting the EU’s external policies through international cooperation in research and innovation as an instrument of soft power and a mechanism for improving relations with key countries and regions. However, critical mass is lacking in many cases and the strategy driving the development of the actions is not always clear. It is therefore expected the bi-regional relation on Science, Technology and Innovation will need to be made sustainable through an uptake of the coordination mechanisms by the stakeholders involved. In this context, provision of up to date analytical evidence on key players and competences in the targeted countries is of importance [13] and contribution towards the need to have a strong focus on key stakeholders in the target region. This has not been properly addressed.

Consequently, the literature review points out two main implications and necessities. The first implication is to consider developing a relevant framework to identify the key stakeholders. The second implication is that this framework should map national and regional stakeholders who can influence and address the societal challenges and thereby to develop an inventory of the national and regional stakeholders. There is an overall lack of a cohesive strategy to collate the current analytical evidence within the South Asian region on the key players and their competences.

3.0 Stakeholder identification and mapping methodology

Stakeholder analyses are now arguably more important than ever because of the increasingly interconnected nature of the world. There was a need to identify and map key national and regional stakeholders who can influence and address the societal challenges and thereby to develop an inventory of the national and regional stakeholders. The development of the inventories and the mapping of stakeholders were a collaborative process of research, debate, and discussion that drew from multiple perspectives to determine a key list of stakeholders at the national and regional level and their extent of stake in the seven societal challenges in terms of power and interest.

Guidance on identifying key stakeholders was provided for the South Asia partners. Accordingly, identification of stakeholders (amongst other objectives which aren't reported in this paper) was conducted via a detailed Policy and trend analysis of societal challenges in South Asia partner countries and via Interviews and Focus groups with experts who have the knowledge and experiences in one/ several areas of social challenges. During policy analysis phase, a content analysis approach was carried out to analyse available policies in the targeted seven South Asian countries and the focus was specifically on each of the seven societal challenges targeted under Horizon 2020. This phase set out the current statistics and trends, assessed the policy availability in each area, carried out a situational analysis, and finally, identified key informants that have knowledge or are responsible for developing policies in those areas. These key informants provided the basis for identifying interview and focus group respondents. Subsequent semi-structured interviews were used to gather information on each of the Horizon 2020 challenges and to gain an understanding of each challenge, its impact to the society and country and associated stakeholders. The experts represented academia, industry and public organisations. 348 interviews were conducted across the seven South Asian partner countries. Following analysis of the interview data, a series of focus groups were conducted to get an overall perspective and consensus on all seven Horizon 2020 challenges, to get an understanding of the key challenges and their impact to the society and country and to further identify key stakeholders. There were 135 focus group participants across the seven countries. The experts represented academia, industry and public organisations. Identified stakeholders through these processes were those who could offer a broad range of input linking to the Horizon 2020 societal challenges and that can influence the global challenges and research priorities relevant to the South Asian region.

Thereafter, stakeholder identification and mapping protocols were discussed in detail with the South Asia partners during a workshop. The first step of stakeholder identification and mapping is to select one of the seven societal challenges identified under Horizon 2020. The next step is to identify the stakeholders that can influence or be affected by the challenge based on the lists of stakeholders identified from the above described interview and focus group responses.

The stakeholder inventories were compiled under six categories of stakeholders which acted as the checklist for stakeholder identification. The categories were, National and local government (Public and semi-public entities that have interest in global societal challenges and research priorities); international organisations (Non-profit making organisations which possess membership of more than one country and set up as intergovernmental organisations or international non-governmental organisations); Community (Individuals and groups that has direct interest in global societal challenges); Civic society (Non-governmental organisations (NGOs) that participate in research related Global Challenges, including not-for-profit and voluntary groups that are organised on a local, national or international level); Private and corporate sector (Privately owned profit-orientated business and industrial groups); and Academia and professional associations (Universities, research organisations, and professional associations engaged in research, and training and development of individuals and organisations involved in global societal

challenges). The stakeholder categories, their definitions [15] with responsibilities are presented in Table 1. Stakeholder identification and mapping protocols were discussed in detail with the South Asia partners.

Table 1: Stakeholder categories and their definitions

Stakeholder Type	Definition	Responsible For
National and local government:	Public and semi-public entities that have interst in Global Challenges and research priorities	Mediate between private and public interests and as an actor with local, national and international connections. Coordination of different stakeholders at different levels Develop and enforce rules, laws and regulations.
International organisations:	Non-profit making organisations which possess membership of more than one country and set up as intergovernmental organisations or international non-governmental organisations	Policy making Coordination among different nations Provide necessary aid and support
Community:	Individuals and groups that has direct interest in Global Challenges	Users and occupants Participation, experience and leadership towards the necessary actions.
Civic society:	Non-governmental organisations (NGOs) that participate in research related Global Challenges, including not-for-profit and voluntary groups that are organised on a local, national or international level	Work with and on behalf of most needy groups: the poorest and the most vulnerable. Operate at grassroots level with communities and local organisations as partners. Take a participatory approach to development planning. This allows them to respond better to local people's priorities and build on local capacities.
Private and corporate sector:	Privately owned profit-orientated business and industrial groups	Driving force behind socio-economic development. Developers, consultants, contractors and sub contractors, banks and finance institutions that design, construct, maintain and finance the necessary infrastructure/facilities. Responsible for implementation of policies, regulations and standards
Academia and professional associations:	Universities, research organisations, and professional associations engaged in research, and training and development of individuals and organisations involved in Global Challenges	Related education. Training. Research and development. Development of technical standards and guidelines.

A template was introduced to the South Asia partners to present the stakeholder inventory under the aforementioned six stakeholder categories. The template was significant to maintain the consistency of the inventories among partners. As it was likely the identification stage will result in a long list of stakeholders, it was therefore necessary to confirm that each individual or group that has been identified is actually a stakeholder and also what the nature of the stake is. Understanding the stake is vital in order to prioritise stakeholders and design effective engagement strategies for the future. The stake may be one of the examples below, or a combination:

- Interest - Affected by a decision related to the project
- Authority - To take decisions to address the challenge
- Responsibility - To address a challenge
- Rights - To be treated in a certain way, or have rights protected; it may be legal or moral
- Ownership - A legal right to an asset or property
- Knowledge - Specialist knowledge
- Capacity - Necessary capacity
- Impact or influence - Impacted by work or its outcomes
- Contribution - Supply or resources, funding

3.1 Stakeholder mapping

Stakeholder mapping is a way of determining who among stakeholders can have the most positive or negative influence on an effort or who is likely to be most affected by the effort so that appropriate engagement strategies can be identified for future interventions. In order to summarise the characteristics of stakeholders, it is often useful to use tables or charts as a means to group or prioritise stakeholders so that appropriate engagement strategies can be identified. Stakeholder analysis is frequently conducted in terms of power/influence vs interest/importance. Mendelow's Power-Interest Matrix originally developed by Aubrey L. Mendelow presented in Figure 1 is a well established technique used in stakeholder mapping and this was the technique employed in the project to analyse the power and interest of stakeholders in relation to the societal challenges [7]. The techniques prioritises the stake by means of Power and Interest of stakeholders, and it helps to inform the level of engagement required for different stakeholder groups:

Power		Low	High
	High	Maintain these stakeholders in a happy state	Manage these stakeholders closely
	Low	Keep an eye on these stakeholders and act when prompted	Keep these stakeholder happy and informed

Interest

Figure 1: Power-Interest Matrix

Accordingly, power vs interest analysis was conducted in relation to each identified stakeholder in mapping their stake in global societal challenges. Each stakeholder's power to influence the societal challenges and their interest in the respective societal challenge in a country were mapped based on the informed judgement of the project partners of each South Asia country against four different power vs interest criteria using the template. The criteria was, High Power- High Interest (Hp,Hi), High Power- Low Interest (Lp,Hi), Low Power- High Interest (Lp,Hi) and Low Power- Low Interest (Lp,Li). As a result, stakeholder inventories and maps were produced for each individual South Asia Country identifying a list of stakeholders for all seven societal challenges.

4. Results and discussion

The resulted framework which was subsequently used for the stakeholder inventory and mapping for all the seven societal challenges in all the target South Asian countries is presented in Figure 2. Accordingly, South Asia country partners prepared stakeholder inventories for their countries for each challenge using the resulted frameworks. This framework helped to identify and develop an inventory of the national and regional stakeholders that can influence the societal challenges and research priorities relevant to the South Asian region. Further, the identified stakeholders were mapped against their power to influence the societal challenges and their interest in the challenges.

Country: **Challenge n (1-7)**

Stakeholder Type (A)	Definition (B)	Individual Groups (C)	Key Contact (D)			High Power (Hp), High Interest (Hi), Low Power (Lp), Low Interest (Li)			
			Name	Job Title	Contact Details	Hp, Hi	Hp, Li	Lp, Hi	Lp, Li
National and local government:	Public and semi-public entities that have interest in Societal Challenges and research priorities								
International organisations:	Non-profit making organisations which possess membership of more than one country and set up as intergovernmental organisations or international non-governmental organisations								
Community:	Individuals and groups that has direct interest in Societal Challenges								
Civic society:	Non-governmental organisations (NGOs) that participate in research related to Societal Challenges, including not-for-profit and voluntary groups that are organised on a local, national or international level								
Private and corporate sector:	Privately owned profit-orientated business and industrial groups								
Academia and professional associations:	Universities, research organisations, and professional associations engaged in research, and training and development of individuals and organisations involved in Societal Challenges								

Figure 2: Framework for stakeholder inventory and mapping

The framework was significant to maintain the consistency of the inventories among partners. A section for stakeholder mapping was also integrated into the template. A power vs interest analysis was conducted in relation to each identified stakeholder in mapping their stake in societal challenges. Each stakeholder's power to influence the societal challenges and their interest in the respective societal challenge in a country were mapped based on the informed judgement of the project partners of each South Asia country against the following criteria using the framework.

- High Power- High Interest (Hp,Hi)
- High Power- Low Interest (Lp,Hi)
- Low Power- High Interest (Lp,Hi)
- Low Power- Low Interest (Lp,Li)

Key stakeholders were mapped based on each target country which will result in Long-term research exchange programmes; joint research infrastructure, training and other programmes at the regional level. Idea of research as a shared 'parallel' competence is promoted with coordination helping focus resources, reduce duplication, improve impact.

Accordingly, a South Asian stakeholder inventory under six categories were developed: National and local government; International organisations; Community; Civic society; Private and corporate sector; and Academia and professional associations, for the target seven South Asian countries. In this context, South Asia country partners prepared stakeholder inventories for their countries for each challenge using the above framework. (Note: the scope of this paper is to discuss the framework development process, rather than detailing the contents of stakeholder inventories produced by target countries for each societal challenge, details of which are unable to present due to confidentiality reasons). The identified stakeholders are those who can offer a broad range of science, technology and innovation input linking to the Horizon 2020 societal challenges, and that can influence the global challenges and research priorities relevant to the South Asian region. Further, the identified stakeholders were mapped against their power to influence the societal challenges and their interest in the challenges.

5. Conclusions

CASCADE was structured around achieving promotion and exchange of ideas between the EU and the South Asian region, and facilitated stakeholder engagement at various levels via activities that were planned and delivered including series of meetings/workshops and training events that were organised. the mapping of the key stakeholders helped to advance the state of scientific and technological cooperation between Europe and the targeted South Asian region, thereby contributing to the transfer of knowledge as well as contributing to foster dialogue between European and South Asian policy makers. Mapping was a collaborative process of research, debate, and discussion that draws from multiple perspectives to determine a key list of stakeholders at the national and regional level. The identified stakeholders will be those that can influence the global challenges and research priorities relevant to the South Asian region. The analysis identified how a stakeholder is important and what is their 'stake'. This enabled the prioritisation of stakeholders as well as the design of effective engagement strategies for the future. Using the mapping as a basis, CASCADE resulted in an inventory of national and regional stakeholders related to global challenges in all of the seven target South Asian countries. The inventory can be used to promote relevant Southern Asian stakeholders to European stakeholders at relevant events through the network and beyond. In this context, CASCADE provided a new approach that is needed to engage more actively and strategically in international cooperation with the identification of target country based societal challenges with key stakeholders being mapped to those challenges. This helps the EU to revise its objectives and principles based on geographic differentiation with more targeted actions being incorporated in their calls within Horizon 2020 and covering the region covered by CASCADE. This further helps to enhance the impact of EU funding and its international cooperation through improving scale and scope based on common interest and mutual benefit by making Horizon 2020 truly open and attractive to the best and brightest in the world.

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